Space Weather Forecast

Issued on Thursday, 26 May 2022 at 13:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1-R2 Radio Blackouts declining. CME arrival likely early day 3 (28th) with G1/G2 Minor to Moderate Storm intervals likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with Moderate flare from an old sunspot region in the southwest disc. There are two further notable sunspots, both in the northwestern quadrant although neither region has demonstrated significant activity. A region is the southeast has now been assessed as a simple unipolar region with the remaining regions either simple or declining and present only a small risk of significant flares. The Moderate flare was followed by a moderately fast coronal mass ejection, which has been analysed as likely glancing Earth early morning on day 3 (28th). No further Earth-directed CMEs have been observed on available imagery.

Solar Wind / Geomagnetic Activity: The solar wind has been ambient in a benign solar wind environment. Total magnetic field strength was mainly weak, with the north-south component of magnetic field weak throughout. Geomagnetic activity has been Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low, but with a risk of further Moderate activity and a very slight risk of High activity. The main source of this heightened risk are two active regions in the northwest quadrant, with the risk decreasing as this rotates away around the west limb.

Solar Wind / Geomagnetic Activity: Currently ambient solar winds are likely to become enhanced later day 1 (26th) due to the arrival of the fast wind from a coronal hole. A CME is then expected to arrive early day 3. This is likely to be a glancing impact, with solar winds easing back towards background day 4 (29th). Quiet geomagnetic activity at first day 1 (26th) is likely to become Unsettled to Active into day 2 (27th) with a slight chance of G1 Minor Storms. The impact of the CME gives a likelihood of G1/Minor Storms with a chance of G2 Moderate storms, most likely early day 3 (28th). Geomagnetic activity then easing day 4 (29th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring, although there is a slight chance due to the large sunspots on the northwest disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	40	60	10
Strong	G3	No	1	5	10	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	20	10
Very Active	R3 to R5 X	No	10	5	2	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	2	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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